

AMENDMENTS TO THE CLAIMS

Please amend the claims as set forth below. This listing of claims replaces all prior versions, and listings, of claims in the application:

Listing of Claims

1-14. (Canceled)

15. (Currently Amended) A battery backup apparatus ~~for use~~ connected with a movable barrier movement operator which includes a DC power supply, the battery backup apparatus comprising:

a battery;

a battery charging circuit coupled to the battery; and

a unidirectional conduction path between the battery backup apparatus and the movable barrier operator, the unidirectional conduction path including a unidirectional isolation device and impedance element,

~~wherein~~ the battery backup apparatus [[is]] connected to a plug on the movable barrier operator, the plug including a receptacle, and ~~wherein~~ the battery charging circuit [[is]] configured to receive a DC voltage from [[a]] the DC power supply located within the movable barrier operator [[via]] through the plug and the impedance element[[, and]] to charge the battery when the DC voltage from the DC voltage supply exceeds a predetermined voltage~~[[;]]~~ ,

~~wherein~~ the battery backup apparatus [[is]] further configured to provide a battery backup voltage [[at]] through the plug and the unidirectional isolation device, the battery backup voltage being provided from the battery when mains voltage to the movable barrier operator fails; and

~~wherein the battery backup voltage is provided to the DC voltage supply located within the movable barrier operator via a conduction path that is located within the movable~~

~~barrier operator, and wherein the conduction path located within the movable barrier operator comprises a unidirectional isolation device.~~

16. (New) A battery backup apparatus in combination with a barrier movement operator, the combination comprising:

a movable barrier operator, the movable barrier operator comprising:

a DC voltage supply having a mains input voltage, the mains input voltage receiving a mains voltage;

a barrier movement control coupled to the DC voltage supply via a DC power connection;

at least one unidirectional/impedance conductive path connected to the DC voltage supply, the conductive path including a unidirectional isolation device and an impedance element;

a plug coupled to the conductive path, the plug externally accessible from the movable barrier operator and including a receptacle;

a battery backup apparatus comprising:

a battery having first and second terminals;

a battery charging circuit which receives a DC voltage from the DC voltage supply via the unidirectional/impedance conduction path which battery charging circuit charges the battery when the DC voltage from the DC voltage supply exceeds a predetermined voltage and a conduction path through the unidirectional isolation device connecting a battery DC voltage from the first battery terminal to the DC voltage supply such that a magnitude of the battery dc voltage is conducted along the unidirectional/impedance conduction path without being substantially adjusted by any intervening electrical device along the unidirectional/impedance conduction path when mains voltage to the mains voltage input fails.

17. (New) The combination of claim 16 wherein the battery backup apparatus includes an audible signaling device.

18. (New) The combination of claim 17 wherein the battery backup apparatus includes an apparatus for enabling the audible signaling device in response to current flowing from the battery to the DC voltage supply of the movable barrier operator via the unidirectional isolation device.

19. (New) The combination of claim 16 wherein the battery backup apparatus includes one or more visual signaling devices.

20. (New) The combination of claim 16 wherein the battery backup apparatus comprises circuitry for limiting a current applied to a battery terminal of the battery.

21. (New) The combination of claim 20 wherein the circuitry for limiting, limits the current to an amount less than a predetermined maximum amount.

22. (New) The combination of claim 16 wherein the battery backup apparatus includes cut out circuitry for disconnecting a battery terminal of the battery.

23. (New) The combination of claim 16 wherein the impedance element and unidirectional isolation device are connected in parallel.

24. (New) The combination of claim 16 wherein the impedance element comprises at least one resistor and the unidirectional isolation device comprises a diode.

25. (New) The combination of claim 15 wherein the battery backup apparatus includes an audible signaling device.

26. (New) The combination of claim 25 wherein the battery backup apparatus includes an apparatus for enabling the audible signaling device in response to current flowing from the battery to the DC voltage supply of the movable barrier operator via the unidirectional isolation device.

27. (New) The combination of claim 15 wherein the battery backup apparatus includes one or more visual signaling devices.

28. (New) The combination of claim 15 wherein the battery backup apparatus comprises circuitry for limiting a current applied to a battery terminal of the battery.

29. (New) The combination of claim 28 wherein the circuitry for limiting, limits the current to an amount less than a predetermined maximum amount.

30. (New) The combination of claim 15 wherein the battery backup apparatus includes cut out circuitry for disconnecting a battery terminal of the battery.

31. (New) The combination of claim 15 wherein the impedance element and unidirectional isolation device are connected in parallel.

32. (New) The combination of claim 15 wherein the impedance element comprises at least one resistor and the unidirectional isolation device comprises a diode.

33. (New) A battery backup apparatus in combination with a barrier movement operator, the combination comprising:

a movable barrier operator, the movable barrier operator comprising:

a DC voltage supply having a mains input voltage, the mains input voltage receiving a mains voltage;

a barrier movement control coupled to the DC voltage supply via a DC power connection;

at least one unidirectional/impedance conductive path connected to the DC voltage supply, the conductive path including a first branch including a unidirectional isolation device and an a second branch including an impedance element, the first branch being connected in parallel with the second branch;

a plug coupled to the conductive path, the plug externally accessible from the movable barrier operator and including a receptacle;

a battery backup apparatus comprising:

a battery having first and second terminals;

a battery charging circuit which receives a DC voltage from the DC voltage supply via the second branch of the unidirectional/impedance conduction path which battery charging circuit charges the battery when the DC voltage from the DC voltage supply exceeds a predetermined voltage and a conduction path through the first branch of the unidirectional isolation device connecting a battery DC voltage from the first battery terminal to the DC voltage supply such that a magnitude of the battery dc voltage is conducted along the unidirectional/impedance conduction path including the first branch without being substantially adjusted by any intervening electrical device along the first branch of the unidirectional/impedance conduction path when mains voltage to the mains voltage input fails.

34. (New) The combination of claim 33 wherein the battery backup apparatus includes an audible signaling device.

35. (New) The combination of claim 34 wherein the battery backup apparatus includes an apparatus for enabling the audible signaling device in response to current flowing from the battery to the DC voltage supply of the movable barrier operator via the unidirectional isolation device.

36. (New) The combination of claim 33 wherein the battery backup apparatus includes one or more visual signaling devices.

37. (New) The combination of claim 33 wherein the battery backup apparatus comprises circuitry for limiting a current applied to a battery terminal of the battery.

38. (New) The combination of claim 37 wherein the circuitry for limiting, limits the current to an amount less than a predetermined maximum amount.

39. (New) The combination of claim 33 wherein the battery backup apparatus includes cut out circuitry for disconnecting a battery terminal of the battery.

40. (New) The combination of claim 33 wherein the impedance element comprises at least one resistor and the unidirectional isolation device comprises a diode.